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Stack4Things: An OpenStack-Based Framework for IoT

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Abstract

© 2015 IEEE. In the wake of the massive adoption of embedded systems, mobiles, and other smart devices, as the scope of their involvement keeps broadening, complexity may quickly become overwhelming and vertical ad-hoc solutions will not cut it anymore. We propose to reuse as much tooling as possible, taking into account suitable options with regard to infrastructure management, then piggybacking as much advanced functionalities as possible in such kind of environment. In this sense, a widely used and competitive framework for Infrastructure-as-a-Service such as OpenStack, with its breadth in terms of feature coverage and expanded scope, looks like fitting the bill. This work therefore describes the approach and the solutions so far preliminary implemented for enabling Cloud-mediated interactions with droves of sensor-and actuator-hosting nodes by proposing Stack4Things, a framework for Sensing-an--Actuation-as-a-Service. In particular, we focused on describing the subsystem of Stack4Things devoted to resource control and management, highlighting relevant requirements and justifying how our proposed framework addresses them, while also opening up possibilities for a range of future extensions towards complete fulfillment of the Sensing-and-Actuation-as-a-Service vision.

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Keywords

Cloud, IoT, OpenStack, SAaaS, WAMP, Web Socket